UNIVERSITI TEKNOLOGI MARA

INVESTIGATION THE EFFECT OF AP AND PA PROJECTIONS ON TESTIS AND OVARY DOSE DURING LUMBAR IMAGING AT VARIOUS TUBE POTENTIALS (KVP)

WAN NUR'IZZATI BT WAN AZIZ

BACHELOR IN MEDICAL IMAGING (HONS)
FACULTY OF HEALTH SCIENCE

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulation of University Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of Student	:	Wan Nur'izzati Bt Wan Aziz
Student I.D. No.	:	2011480218
Programme	:	Bachelor of Medical Imaging (Hons.) – HS222
Faculty	:	Health and Science
Thesis Title	:	Investigation the effect of AP and PA projections on testis and ovary dose at various tube potentials (kVp).
Signature of Student	:	……...
Date	:	July 2015

ABSTRACT

Purpose: The aim of this study is to investigate the effect of AP and PA projections on testis and ovary dose at various tube potentials (kVp).

Methodology: The study was an experimental study. A whole body and RANDO phantom was exposed three times with different kVp techniques by using computed radiography (CR). The entrance skin doses for testis and ovary were measured by placing the thermoluminescense dosimeters (TLDs). The dose delivered to the testis was measured by create testes using a balloon filled with water and place approximately at location of male testes. Meanwhile, the measurement for ovary dose was done on RANDO phantom at slice 29 and the suitable place for TLD chips placement is 9cm from the anterior surface of abdomen and 6cm from midline based on 'average size' woman. After 24 hour, all TLD chips were read by Harshaw 3500 TLD reader to measure the doses.

Result: The descriptive analysis showed that the mean of testis dose is directly proportional to the increase various tube potentials. The mean of ovary dose is inversely proportional to the increase various tube potentials. The mean dose of reduction percentage for ovary is 5.5% which is higher than reduction dose in testis. The mean dose of reduction percentage for testis is about 2.3%. Two-way ANOVA test for reproductive organs doses at various kVp found that there were significant difference between the variables since the p-value is < 0.05 (0.01). The pos-hoc analysis (Tukey's) recommends that the p-value is <0.05 (0.01) which indicate that there is a significant difference between various tube potentials and doses in two projections.

Conclusion: Increase in kVp techniques significantly increases the testis dose while the ovary dose was decrease when kVp is increase. The mean dose reduction for ovary and testis was approximately about 5.5% and 2.3%. The dose reduced much higher in female compare than male when PA projection is applied to the phantom. Thus, the researcher recommends for the implementation of PA projection for routine lumbar spine examinations.

key word: lumbar spine, testis dose, ovary dose, AP projection, PA projection, computed radiography

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